Portland Harbor Data Gaps Clarification Meeting
Olympic Club and Hotel
Centralia, Washington
December 13, 2005
9am – 4pm

Participants

Eric Blischke	Bob Genesemer	Nancy Musgrove
Chip Humphrey	Joe Goulet	Rick Applegate
Jean Lee	Burt Shephard	Carl Stivers
Matt McClincy	Jennifer Peterson	Taku Fuji
Jim Anderson	Bruce Hart	Gene Revelas
Christine Koch	Merv Coover	Keith Pine
Sylvia Kawabata	Debbie Silva	Bill Locke
Keith Johnson	Mike Olsen	Lisa Saban
Valerie Lee	Dana Davoli	Mikell O'Mealy
Chris Thompson	Rene Fuentes	Erin Madden, Nez
Jeremy Buch	Dave Livesay	Perce

Goal: provide high-level clarification on 12/2 data gaps memo.

- Avoid getting into too much technical detail, but instead focus on broader technical clarifications
- Set policy and legal issues aside for now

Questions captured during the meeting by Mikell O'Meally are included as Attachment 1.

Minutes from the discussion (notes from Valerie Oster)

I. Overview

A. Chip Humphrey and Eric Blischke provided an overview of the goals and objectives for the meeting. Chip indicated that the goal for today's meeting is to clarify technical issues and concerns, but not to try and "fix" them here. Policy and legal issues will be set aside for later discussion. This is the first attempt to reengage after the EPA timeout, and there will be additional meetings in the coming weeks to discuss the way forward. Chip noted that Mikell O'Mealy would serve as facilitator for today's meeting, and would be keeping the technical discussion limited in order to ensure that we progress through the agenda and touch on all the topics. Eric noted that the EPA team tried to provide rationale and justification for the data gaps in the

memo. To the extent where things are still unclear to the LWG, this meeting is about providing clarity, but not to get into deep technical detail. EPA expressed their desire to reengage with LWG on the data and RI/FS process.

B. Chip noted that the memo does not provide guidance on sampling but rather that this memo provides guidance for developing the necessary sampling plans. EPA will provide additional detail on the scope of work and specifics for 2006 in late January.

C. Rick Applegate said on behalf of the LWG, that this document is very helpful and useful, and LWG appreciates the time EPA took to develop it. He noted that there are still conversations LWG needs to have with senior managers concerning this memo and the way forward, and emphasized the need to get clarity, and that there will be time for follow-up over the next few weeks.

D. Chip noted their appreciation for the list of questions received from LWG in advance of the meeting.

E. Mikell O'Meally indicated that EPA will begin each section of the agenda with a brief overview, and then people can jump in as appropriate with questions. Eric explained that in their overview of the sections, EPA and its team would try to highlight important issues.

F. Chip noted that there were some limitations in reviewing the Round 2 data – e.g., some data are still being collected – and this information may eventually help clarify some of the issues raised in the data gaps memo.

II. CSM

A. After the August data retreat, the EPA team wanted to look at the whole system, focusing on the area between falls and Columbia, to understand its operation and sources of contamination, the physical and ecological perspective of the system, etc. There were some preconceived ideas of how the system works, and EPA wanted to try to see what data was needed to validate or clarify the assumptions that formed those ideas:

- Willamette Falls is the upstream barrier; the agencies believe that sediment trap information and other data may be needed to understand contributions from sources upstream of the Falls.
- From the Falls to Ross Island, the river behaves differently – it's narrow and faster, and not a depositional environment. There are also more limited sources in this reach – maybe the pulp mills and tributaries (e.g. Johnson creek). The

downtown area just above the study area poses the most likely additional source to the current study area – from Zidell and Schnitzer just north of Ross Island is historically very industrial, where sources of contamination could flow downstream (Station L, gas plant, city outfalls, etc.). There is currently very little data collected in this area aside from already known contaminated sites, like Cargill. There is a need to understand the sources and their potential to transport contaminants to the study area and what the recontamination potential might be. There is also a need to get data to support setting the site boundary.

- Downstream of the study area there may be contaminants moving downstream into Multnomah channel or toward the confluence of the Columbia. If there is significant contamination moving downstream, the site might need to be expanded to deal with them.
- There are existing upstream data points that weren't in the EPA database. This data has been identified by LWG, and will be included in an updated database.

B. Nancy Musgrove asked if, at this point, EPA was not clear about existing data that could exist to clarify some of these questions. Eric indicated that they know there is data off Zidell and Schnitzer that wasn't in the database and that there is also data from the Ross Island RI, but noted that it is unlikely that material from Ross Island would move into the study area. Additionally, there are other upstream data that might help understand background in terms of levels of contamination within the watershed. Nancy noted that this identification of additional data could potentially be a task for going forward.

C. Gene Revelas noted that the latest version of the database has captured some additional data between RM 11 and the Falls, but that there are not a lot of data points on the map at this time. Eric indicated that EPA might want data above the Falls to help determine background for the system. In terms of Fate and Transport modeling, loading needs to be understood. Eric acknowledged that there are some good data at the upstream boundary, but that there is a need to know about what happens in an extreme event to sediments that are released from behind the Falls. Eric indicated getting data from upstream of the Falls may help to answer the question. Gene noted that there may be trouble conceptualizing how these sediments would be transported over the Falls, if at all, because there would be many assumptions and inferences involved. Technically you might look at what comes into a site at a big event, or just after a big event, but otherwise it's not clear how sampling data from upstream of the Falls would be linked to the site or how we would distinguish the material coming into the site from above the Falls. Eric emphasized that the point is that there is not a lot of

information on what is up there [above the Falls], and that at some level this needs to be understood.

D. Lisa Saban asked about how the EPA team might determine which chemicals to look for upstream in terms of recontamination potential. She noted that we know there is unacceptable risk for some COPCs, but wanted to know if EPA had identified others, or if the topic had been specifically discussed. Eric indicated that this had not yet been resolved, and that the PRGs would facilitate the selection of COIs. It's hard to envision what would be excluded because most chemicals already screen in. Jean Lee noted that to some extent, this would depend on what is actually above the falls, and it's hard to know what to focus on without knowing what's up there.

E. Carl Stivers asked that if a hotspot was discovered upstream of the Falls, what would be the next step in dealing with the recontamination issue that would pose? Eric indicated that this issue had not yet been discussed, and that recontamination potential would likely be a separate concern, and might depend on what is found and where it is within the system. Eric noted that if we don't find anything except close to the current boundaries of the study site, that maybe the decision would be to expand the site.

F. Bill Locke noted that he appreciated the division of upstream reaches into meaningful segments, but questioned whether there was enough understanding of the River upstream of the Falls to support a study design. He noted that it sounded like a big undertaking if there was not any information on bathymetry or sediment chemistry. He also asked if there would or could be a distinction between what is coming from upstream generally, and in the case of a big event.

G. Eric indicated that from the perspective of above the Falls, the big events are of interest to add to the understanding of the function of the system relevant to the study area. Carl noted that the large flow events would be considered in the Feasibility Study, and that there would be some information on the likelihood of erosion, etc. from the hydrodynamic model. There is already TSS data from large events, and a transect at RM 27 may provide data that could be extrapolated in this regard.

H. Carl asked if background was likely to be set well upstream of the [to be determined] site boundary, and Chip noted that EPA hasn't gotten the tech memo on this yet. This info could be useful for background, site boundary, etc, and EPA would like to be able to start considering these issues. There was some additional discussion about the concept of background and the definition that will be used. Bill suggested that for the immediate needs, sediment trap data in the reach from RM14 to the Falls would be more meaningful than bedded sediment data from upstream of the Falls. He asked how a study upstream of the Falls would be designed and what information would it provide? Jean felt that the concern would still be the big

event and its impacts, and Bill felt that the sediment trap data from even a high flow event in a typical year would give an idea of what would come out of a larger event. Eric reminded the group that at this point, EPA is throwing out ideas of things that need to be considered, and that there isn't a "best way" to answer these questions. He noted that in a big rain event, it is very visible that sediment is coming over the falls, and EPA feels that there needs to be some understanding of what is moving.

I. Carl asked if the fish tissue sampling upstream would be used for anything else besides establishing background. Eric indicated that it would be primarily for determination of background, but the study has not yet been designed.

J. Gene noted the physical distinction in the river between RM11-14 and RM14 to the Falls, and suggested that the study design would need to be different for each area based on what we already know of the river. Chip said that he was not sure if a grid approach from RM11-14 or RM11- Falls was being considered at this time, and that the concern was mostly about the lack of data. The biota gaps suggest there is more need for tissue data, but not necessarily throughout the site.

K. Carl asked if there was any idea of how far one might look down Multnomah Channel for sediment sampling. Eric responded that there are other known sources of contamination as you move down channel and so we're really interested in just what could move into Multnomah channel from the ISA through evidence of deposition from the site. Carl suggested that sources might be difficult to find if there isn't any physical data. He suggested placing a sediment trap at the mouth of the channel. Eric indicated that perhaps sediment profiling or bathymetry is needed at first to determine how to collect the information.

L. Rick asked if there were any FSP that may need to be developed that have time or seasonal sensitivity. Gene's opinion was that mostly, there were few time sensitive FSPs. Chip suggested that it might be useful to combine new sampling with sampling already planned.

M. Nancy asked EPA how they would distinguish sources in the lower river when there are issues of two-directional flow, and also asked about how sources would be identified if a depositional area outside the channel and/or below the study area was found. She suggested that there could be a phased or staged investigation that would look at hydrodynamics to see if the issue is a real recontamination threat, because knowing about the physical process first would help to determine if the sampling is needed. Eric indicated that they were just looking at contaminant signatures near the channel. He agreed that understanding physics of the system is important, but was not sure how it would be done in this case. He suggested that

understanding the chemistry would provide a good understanding of what is going on in the channel.

N. Gene noted that there is an existing model from PSU on the channel that could be useful. He said that there are other issues, such as with tides, that confound our understanding of river flow, but the model would be useful to get a better understanding of the physical system.

III. Modeling Needs for Fate and Transport and Food Web Model

A. Bruce Hope from ODEQ has been working with EPA, and attended the meeting to provide his perspective on the Fate and Transport model.

B. Bruce suggested that modeling for Fate and Transport could provide the following:

1. Placeholders for loads;

2. Long-term outcomes of various remedial options;

3. Estimates of future tissue risks and time to recovery of tissue levels after remediation.

C. Bruce went on to explain that the model could be used to develop placeholders for various loadings to understand overall fate of chemicals in the system, and that this has been done in other river systems. The model is based on rate constants for movement of loads. It can be a difficult formulation to use, but it has been done before including by McDonald in the Great Lakes. The politics of what to do with the information is another question. EPA and its team looked at the Food Web Model (FW), and it is encouraging to see the Arnot-Gobas model being used. For Fate and Transport (FT), Ecofate is useful, but there are reasons why it is not being pursued here. The hydrodynamic model is a useful exercise, though it's a bit complex for application to FT. We may already have a lot of data that would be used for FT.

D. Bruce suggested that breaking the FT/FW models into sections would allow for a greater spatial understanding of chemical movement in the system– he would not expect to see the same types of chemical movement in all segments of the river. He noted that we all know that we're dealing with a changing river system (at least seasonally), so the periodicity is also an issue. It will be important that we don't build up expectations for what the model can do. He also mentioned the time scale of forecasting for this type of application and that we may be talking about a 5-20 year process to achieve our outcomes.

E. Carl said that the modeling overview was useful because Bruce went into more detail than was provided in the data memo. Carl suggested that it

would be useful to know which specific FS questions this model would help answer. From the presentation, Carl understood that it is intended to help with predictions of long term outcomes of remedial options and estimates of future tissue risks and time to achieve tissue recovery, which goes beyond what is in the document.

F. Carl asked how this mass-load model would be used to determine concentrations in sediment and surface water, because concentration is how we define effectiveness with remediation. Bruce noted that these simplified models don't simulate bedload transport or other dynamic sediment bed processes, which is complicated. Basically, he said, you can arrive at concentration through the standard formula of mass/volume = concentration. Carl asked if you would use the volume defined by a certain depth of mixed sediment in the bed and Bruce indicated yes.

G. Bruce indicated that the model should produce output in terms readily accessible to decision-makers. He indicated that the model was relatively transparent because it is implemented in an excel spreadsheet platform with visual basic coding to execute iterations and link to the FW Model. He indicated this was preferable to options like Stella software. Carl indicated that Stella is also relatively transparent and widely used.

H. Carl noted that LWG had proposed natural recovery models, which are very focused on interactions at the sediment bed and are time dependent. He asked if there were issues with this simplifications involved in the proposed agency approach of converting masses and volumes to concentrations when comparing to PRGs and other concentration-based remediation goals.

I. Bruce said that one advantage of a comprehensive approach is that it makes the process more "honest" in terms of other relevant input because things are linked (e.g. water to sediment to atmosphere). The "boxes" are not necessarily the same size nor do they function the same – e.g. Swan Island is its own unit and functions very differently than other units. Any model used needs an upward boundary, of course, and that needs to be part of any consideration, because the model needs to account for mass.

J. Carl asked about cases where the model doesn't balance and how that affects use of the model and the use of the "placeholders". Bruce noted that any unexplained results would probably require additional investigation.

K. Carl asked if the model was intended to lead to more a detailed study effort or to a management decision. Bruce responded that the model is not intended to be precise, but it is intended to inform management decisions. The model intends to provide a general picture of loading, and balance isn't as important as the perspective the model provides.

L. Bruce noted that for the FWM, the Agency team is really interested in predicting tissue concentration, and not the complexity of the actual food web. It would be useful to have one continuous model – Figure 7 shows the concept of a multi-segment FT model, and multi-segment FWM, linked to each compartment. This would provide three concentrations by segment – sediment, water, and tissue. The FWM and FT would be sub-models of the overarching model code.

M. Bill asked if the code for linking the FT and FW models had been written and Bruce said that he had mostly written a test version of the code for the linkage but that it would need to be refined and compared to the exact FWM being used by Windward.

N. Carl noted that it was important to be sure that the tissue concentration is obtained soon. Bruce indicated that he felt it was important to EPA to have transparency in the modeling, and that it was important to make sure the variables were ones that matter to the site.

O. Carl asked how data would be collected to support the model. He asked if there would be a need for surface water and sediment collection upstream and downstream of every segment, and both near and away from sources such as stormwater.

P. Bruce suggested that data at the top and bottom of every box was not needed and that with data at select locations within these segments the model would be used to estimate the remainder of the individual mass movements. He said that it does depend on how you want to manage and use the model for spatial related questions. Bruce noted that it would be important to get as much data as possible, but the data don't need to be perfect. If the model shows a big load, but there isn't data at that point, then you might want to go back and do more investigation.

Q. Carl asked if the model could be run as is, with data in hand, to inform a sampling approach and Bruce suggested that you would need a broader spatial and temporal distribution – six samples are not likely to be enough. To be clear, he noted, you can build a model with the available information, but you probably want more data than you have today.

R. Lisa explained that for the LWG FWM, we're using one average water and sediment concentration for the whole river, which is predicting pretty well. If the next step is to break the river or model into segments, then this average concentration approach would need to be reconsidered, and there may be additional data needs. Bruce suggested that there would be additional data needs anyway.

S. Lisa asked how the model would predict tissue concentrations for fish with larger home ranges, and Bruce responded that there was likely a

dampening effect. If you are breaking the river into segments, you must eventually bring them back together. If there is a small range fish, maybe just one segment could be used, but for larger range fish, you might want to put them back together. The model provides some spatial resolution, but you can also bring it back together to get some ideas on larger area.

T. Nancy noted that in the data memo with respect to the FT model, there are certain inputs suggested, and an example of parameters that could be estimated. She asked if at some point, would modelers on the agency side direct LWG on what variables or parameters can rely on existing information and what we need new data for. Bruce said that the system-related environmental parameters are quite short and that the largest gap is in the settling rate and resuspension rate, and that it would be good to have this data. The model is moving mass, and these rates control how much is moving, and therefore the rates are important to accurately calibrate.

U. Bill asked about the advantages and disadvantages of attempting to predict tissue recovery times given the level of uncertainty around this. He also asked how much additional confidence the agencies' proposed modeling approach would bring to the recontamination, MNR, and FW evaluations. Finally, he wanted to know what EPA thought about the schedule implications for embarking on this course of action.

V. This last question was identified as a broader question relevant to other areas of work.

IV. Areas of potential concern

A. Chip described the Agency team process for identifying Areas of Potential Concern (AOPCs), and emphasized the fact that these are not yet Sediment Management Areas. The first step was to screen the data in a few different ways to try and tease out the more contaminated areas from less contaminated areas. Based on some lower screening criteria, the whole river would light up. EPA and DEQ looked up and down the river and thought about Nature and Extent and the data in hand, and came up with 24 AOPCs through consideration of multiple screening criteria, and including the use of PECs. In general, the Agency team wanted to try to come up with smaller areas. Some boundaries were drawn using GIS to encompass data points and focus; Swan Island, for example, lights up for a lot of things, including DDT and PCBs. The criteria that were used are provided in tables, along with a description of how it was used.

B. There is still incoming or anticipated surface water and TZW data that will be important to consider, but Chip noted that there is still some data gathering that could inform this process. He noted that there are some new data needs for PBDEs, VOCs, and Manganese and for lateral and vertical extent of the site, there are some data gaps that need to be filled. The

Agency team would like to find a way to address these new data needs without going out to re-do round 2. Eric noted that they did consider some upland sources in addition to the data in hand.

C. Carl asked about how upland source information will be obtained and how it fits into the identification of AOPCs. Chip noted that DEQ was involved in the discussion of AOPCs. Most of the information discussed in section 3.2 is for upland parties to collect, but LWG may need to do some analysis and help refine the CSM based on this information. Eric confirmed that information requested in sections 3.1 – 3.3 would feed into the FS, but most of the uplands data needs would be collected by upland parties through the JSCS.

D. Carl asked for clarification in the text, where it indicates a need to estimate the level of certainty acceptable for the FS and use of site-specific risk-based goals. In table 5, some data needs are already proposed, and Carl wondered if there was any conflict between text and table. Eric noted that the Agency team realized the data needs must be refined, and that the consideration of these issues needs to happen more on an area by area basis.

E. Carl asked about the timing of collecting data identified in Table 5 in relation to the development of cleanup goals. Eric indicated that the Comprehensive Round 2 data report should have site-specific PRGs, and that they would use these PRGs to get a sense of cleanup goals. He did not envision asking for more information after the Risk Assessment was completed, but noted that there are no PRGs yet and so some sampling would be needed after the Round 2 report.

F. Nancy asked about where the discussion on riparian soils and plants fits in, and whether it is nature and extent, upland, or Risk Assessment? Eric noted that for the FS, we are looking at river bank erosion and the link to recontamination. The information on riparian soils would inform Ecorisk. There are needs for both.

G. Dave Livesay asked if the source area information needed or collected under DEQ would feed into the FT model as loading information, and Bruce indicated that it could, but would depend on the temporal nature of the data. Eric suggested that loading was very important to understanding sources of contamination to river. Jim Anderson noted that DEQ made a change to the JSCS to emphasize loading on medium priority sites. The upland Responsible Parties should get some of the data, but LWG should get some riparian data. He noted that it wouldn't necessarily be a robust data set.

H. Dave asked DEQ about the importance of seasonality information on stormwater. Jim Anderson said that they were still grappling with the data

needs for this, and that the JSCS uses loading in a narrow context. The dialog may be iterative to develop the data needs.

I. Dave confirmed that it would be important to maintain close contact with DEQ, especially because the overall schedule for collecting upland and stormwater is important, especially how it matches up between DEQ and LWG. Matt McClincy noted that some of the upland data collection won't address loading, but that DEQ would ask upland owners to do so when appropriate.

J. Gene asked how EPA would want the COI data gaps to be filled. Chip said that archived sediment could be used for this, but Eric noted that the PBDEs need to be discussed further.

K. Taku Fuji cautioned that everyone wants to avoid having to redo all the sampling, and some of the COI issues would need to be worked through iteratively. Dana suggested that to obtain PBDEs, more fish tissue samples would be necessary. She noted that there's no certainty yet on where or how many, but that it will be determined through additional discussions.

L. Gene asked for clarification and definition of the terms ordinary high water vs. mean high water, and asked if this zone had been mapped. Eric indicated definitions existed, noting that they were previously defined for the project. He indicated that this area has not been mapped, but that they hope to do so.

M. Carl felt that it was good to develop AOPCs initially rather than SMAs. He suggested that it might be useful to overlay other FS-related information to get to SMAs, and Chip and Eric agreed.

V. Ecorisk

A. Mikell provided an overview of the Agency team discussion on Ecorisk, and noted that the discussion led to the development of the data needs table. She explained the inclusion of the Management Goal and Objectives. These were developed to explain why we're cleaning up the harbor and what we're trying to accomplish. They should help provide direction for sampling work and give a sense for what is most important, and what uncertainty we're willing to accept. They provide the rationale for filling data gaps. The Agency team would like them to be part of any future tech memo or working documents from this point forward, including the baseline risk assessment and comprehensive report.

B. Lisa asked about the use of the terms "deleterious effects" in the proposed management goals versus "unacceptable risk" and "survival, growth, reproduction", and whether these two terms are interchangeable, or if there has been a change in the overall goal of the Ecorisk component. Chris Thompson noted that these terms were used to try and encompass

the full range of possible effects. There are places where we do discuss behavioral toxicology and migration corridor interference based on contaminants, which may be arguably linked to growth and survival or not, but that's why we didn't use the term to begin with. Joe Goulet suggested that EPA still needs to make a link to survival etc. because this is in the assessment endpoint memo. Rick asked if the use of the terms constituted an expansion of focus, and the Agency team agreed that this was not their intention.

C. Taku noted that to reduce and eliminate potential exposure is different than identification of unacceptable risk. He asked if it was truly exposure we are concerned with now or if we are still on a risk-based framework. Joe responded that it was one way to address biological integrity of habitat. There was additional discussion on exposure vs. risk and what the overall goal would be, and it was suggested that the wording could be clarified in this section.

D. Bill asked if the management goal was purely a goal for the CERCLA process, or if it were broader. He noted that in section 4.1 the management goal is suggested specifically as a way to guide the ecological risk assessment being performed under CERCLA.

E. Valerie Lee suggested that it would be helpful to integrate other regulatory programs into the CERCLA work. The CERCLA program defines what you do under CERCLA, but that's not everything and we need to think about boundaries and what else needs to happen, though not necessarily by LWG. There are broader objectives for the river that you can't reach just through CERCLA. Eric agreed with this statement, but also noted that the data needs identified in this memo were all intended to support the RI/FS process.

F. Mikell explained the Agency approach to reviewing the EcoCSM. The Agency team looked at the proposed EcoCSM, and made changes to reflect the newly stated management goals and objectives:

1. On the left side, there was more detail to represent complexity and incorporate a wider range of interactions. Several new sources and receptors were added. Some terms were defined and some parts of this side were renamed.

2. On the right side categories were added because they will be assessed as pathways. Different fish types were added because they are distinct exposure scenarios.

G. Lisa asked about data from riparian soils and terrestrial plants, and if the upland owners would be responsible for collecting and assessing this data.

Mikell noted that there should be a footnote here that indicates uplands responsibility for collecting data.

H. There was some additional discussion about the boundary definitions and responsibility. Mikell clarified that the LWG is responsible for sampling up to the ordinary high water mark.

I. Lisa noted that all current sediment samples are in-water, and asked if there would be a need to sample soils up to the high water mark, and if it was a data gap. Eric indicated that they would probably need to see if upland owners have this data, and note the areas where there is seawall, or other built environment before they can determine where sampling would be needed. Jennifer noted that the data gap is likely between mean high and in water.

J. Lisa, on a related issue, noted that LWG has collected two lamprey amocoets during the recent benthic sampling program. They are about 2-3 grams each, and are frozen now. One of these might have been from a grab sample.

K. Mikell explained that the assessment end point table (Table 6) did capture a lot of the data needs. The left 3 columns are basically what LWG would be responsible for, and the right side is EPA and the Agency team. Mikell also noted that some minor changes were made to the food web structures in figures Fig. 5.4 and 5.5. In addition to fish and wildlife food models, she said that the Agency team would like a visual color image, such as a photo or illustration.

L. Mikell noted that the Agency team made refinements to focus on certain chemicals and certain receptors, and hopes to be able to provide more specific direction on this in January.

M. Lisa asked about how all the various lines of evidence were going to be used in decision making, e.g., the LWG is already using multiple lines of evidence, and some are more uncertain than others. Joe indicated that the Agency will have input on weighting the LOE in the end, and Eric acknowledged that they will need to work on this going forward.

N. Nancy noted that there appears to be a shift toward individual receptor vs. whole population, and that the language in this memo is more on individuals (and they are non-listed species). Joe acknowledged that they are interested in getting individual fish samples rather than composites.

O. Chris Thompson noted that the Agency teams were also interested in the individual when looking at fish lesions. One data need that was identified was to correlate PAH levels and external/internal lesions. Composites give you an estimate of mean concentration but not distribution among individual fish. If you do individual fish, you can get distribution, which is the more

accurate assessment of population impact especially if the contamination is not normally distributed.

P. Nancy noted that this could be a very intense sampling program for whole river system, and Chris responded that for large range fish, it wouldn't be very expansive, but could be for a fish like sculpin, and it could impose a new sampling regime because it would be good to have all locations in the ISA an equal opportunity to be sampled.

Q. Nancy asked for clarification on why the Agency team is not comfortable using an estimate of mean for population. Chris explained that if you use composites, and take variation around mean and multiply by the number of fish in the sample, it still assumes a normal distribution; but then some fish might not be contaminated and some might be super contaminated. Eric noted that it would be important for the FWM to show the relationship between size and contamination. Nancy expressed concern that this could be a very extensive sampling effort overall. Jennifer suggested that it may be combined with other sampling and could have multiple uses, and Valerie Lee noted that the scope of sampling is not yet known, so it is currently difficult to discuss the details.

R. Nancy noted that there needs to be some understanding about the level of uncertainty the Agency team is willing to accept in the risk assessment. Each component has an element of uncertainty, and LWG is relying upon multiple lines of evidence to address uncertainty. She expressed her hope that that be taken into account when looking at individual endpoints to determine to what degree will more sampling reduce uncertainty?

S. Eric noted that EPA will have to be able to show that their plan is protective of Human Health and the environment in the end.

T. Lisa asked decisions would still be made on a population level, even if individual fish are sampled, and Eric indicated this was true. Lisa suggested that if LWG samples individual fish, chemical analysis list may have to be reduced because of smaller sample mass. Joe felt this would be true just with sculpin, because of their size.

U. Valerie Lee noted that this possible sampling effort is just about the RI/FS, but from an NRDA perspective there may be more data needed because of the input from trustees. Erin Madden noted that the fish tissue sampling was a concern of the 6 tribes. The Tribes are interested in sturgeon especially, because of their cultural significance. The Tribes are also interested in the integration of the RI and NRD work. Erin noted that the studies required for the RI will probably be necessary for NRD too. Valerie Lee suggested that the LWG needs to decide how to integrate the two, and how to work more cost effectively.

V. Rick noted that the integration of CERCLA/NRDA is a very general overall concern, and will need to be taken up eventually. Lisa asked that if there are data needs that go beyond CERCLA that everyone be very transparent about what these are. Rick asked for confirmation that the studies and analysis on the table now are all totally CERCLA related, or if there was anything that is exclusively NRDA. Valerie Lee stated that there was no exclusively NRDA information being requested.

W. Lisa asked for clarification on the decision process for determining which data "may be needed" as stated in Table 7. Joe suggested that there could be some cases where, upon looking at existing information or information coming in from Round 2, the Agency team may determine a data need or may determine that the data is not needed because existing information answers the question.

X. Nancy asked for clarification on the weighting of lines of evidence. Joe indicated that they are not all equally weighted. Nancy asked if the empirically derived data has precedence over theoretical data, and Jennifer indicated that this would need to be considered on a case by case basis. Burt noted that the Agency Team does not have a problem with the dietary approach, but there is a bit more dietary toxicity data that is available, so we're getting more comfortable with this and just want to make sure we're not being too conservative.

Y. Nancy asked if there was a literature evaluation on species sensitivity. With respect to using invertebrate toxicity information as a surrogate, there aren't good correlations at all for PAHs. If that was a LoE, would that be based on Willamette toxicity data, or would it be a literature based evaluation?

Z. Lisa noted that LWG would like to rely on fish stomach analysis before modeling, and asked for clarification for which would be weighted more. The Agency team felt that the empirical evidence would be more important. Lisa also asked for confirmation that looking at the risk of stomach contents to bird nestlings would be something we look at after we have determined risk, and this was agreed.

AA. Lisa noted that LWG has had difficulty finding sturgeon of the right size and age. Valerie Lee indicated that the Tribes could provide some information on how to get the data and which age classes the Tribes are most interested in. She noted that the Tribes would also like to share their needs in more detail at some point. Joe noted that the Agency team is most interested in the pre-breeding age sturgeon.

BB. Taku suggested that there are useful regional sources of research on sturgeon and may be approached to share data (e.g. Dr. Molly Webb at OSU Department of Fisheries and Wildlife).

CC. Lisa asked about the assessment of adult Chinook and olfactory impacts. Jim McKenna expressed LWG concern about this, as it goes beyond typical understanding of growth, production, and survival. Joe indicated that this inquiry is linked to reproduction, in that the salmon rely on olfactory function to select the path to their spawning ground. Chris noted that the fish is dying as it goes upriver, and so any delay is an injury to that fish. If a fish is delayed by an olfactory problem, that is a harm. It does not have to be tributary wide or river wide to have an effect in my view. Joe noted that the Agency would not support the use of the terms "harm" and "injury" from that statement.

DD. It was noted that EPA with input from the Tribes would provide direction on lamprey in January.

EE. Taku asked if there was a decision matrix developed to determine robustness of the reliability of a BSAF. It was noted that there is no such matrix at this time. Chris noted that in terms of coming up with a BSAF number and policy on how those numbers would be used, it would be important to know what value you are going to use for tissue data, and that depends on how policy decisions are made.

FF.Lisa noted that thus far there hasn't been a good relationship between sediment and sculpin, though there is a relationship with DDT and PCBs with sculpin. Data obtained this fall may show a tighter relation. Under what circumstances would LWG need to do sampling for AVS+SEM? Nancy suggested that other options be considered for getting at bioavailability for benthic community.

GG. Nancy asked if EPA was still uncomfortable with laboratory data on exposure and uptake with respect to assessing benthic toxicity, and if so, if there was an in situ program to consider? Joe indicated that EPA is interested in other options, but feels there are limits to the lab bioaccumulation tests, and that we need to look at individual sites to see what all is contributing to exposure.

HH. Lisa asked about the use of fish and osprey egg data, and what decision drives the need for it, and if LWG would need to get the eggs to fill a data gap. Jennifer indicated that the osprey eggs are a need, to calibrate FWM at upper levels for DDT or dioxin. Jeremy noted that the Agency is not asking for it yet, but may need to do so in the future.

II. Jim McKenna asked how egg TRV would be compared to surface water concentrations, and Jeremy indicated they felt there was a need to have an assessment of early life stage.

VI. Human Health

A. Dana discussed the new Management Objectives for human health, which are essentially revisions to the RAOs. She explained that in the figure, the left half of the Human Health CSM works like the Ecorisk, but from the exposure route to the right side is different. Some of the differences are in the exposure route – e.g., ingestion through drinking water or mother's milk. Mother's milk is being assessed a lot now, so we wanted to add it. Most of the receptors indicated were already in the CSM, but we added onsite worker and resident, divers, and inwater workers' exposure to sediments

B. Taku suggested that the human health management goal was OK, but had questions about the changes to the CSM. He asked for clarification on how bivalve consumption was selected as an exposure pathway, as the LWG understanding was that we didn't want to rely on anecdotal evidence, which is what this appears to be. Dana explained that a diver told EPA and the Health Department that he used to go to a spot within the ISA and get clams. Transients along river also indicate that they are eating the clams. For these reasons, Dana felt clams should be included.

C. Jim McKenna expressed concern on behalf of LWG about the anecdotal nature of this evidence. He cautioned against incorporating this information into the study because it's not scientific – we don't know if the person knows the difference between a clam and mussel, don't know how often they eat, etc. There has also been an issue with even finding clams for our sampling efforts. Chris noted that even though the benthic sledge is not finding clams, there may be some that are accessible closer to shore where people are harvesting them for consumption.

D. Taku asked about how to deal with the consumption rates, and if the clam ingestion could be combined with the crayfish ingestion rates. Dana felt that the consumption rates were too low already. She also suggested that the clam information should be available to the public. Joe asked if mussels from the study area were being eaten, and it was reported that people do eat the mussels. Dana acknowledged that at this time, it was not clear if the data from all shellfish species could be combined or composited.

E. Taku noted that the original understanding was that residential/industrial use of lower Willamette River as a drinking water source was not going to be an exposure pathway to be quantitated in the human health risk assessment and asked why it was being added at this time. Taku stated that undertaking a residential drinking water scenario would require any additional data collection and also would not likely change the conclusions of the human health risk assessment, but that this was a policy issue. Taku noted that adding analytes such as PBDEs, which was discussed before, is sort of along the line of the issue of elevated detection limits for PAHs in fish tissue, and asked if this would call into question the entire existing dataset. Dana indicated that this was not likely.

F. Taku asked for clarification on undertaking upstream tissue sampling considering that we haven't yet established the upstream boundary. Dana noted that this was an issue, which would depend on the site boundaries. If the site extends beyond RM 3 – 6, the agencies would like additional tissue. The same is true for the area just beyond the boundaries that are eventually identified.

G. Taku noted that it would be possible to overlay the transition zone sampling evidence with areas where we have tissue collected, and asked if the empirical data would trump the model. Dana indicated that yes, most likely it would.

H. Taku asked about the objective for getting additional small mouth bass samples at specific sources. Dana explained that based on discussions with a local pan fishing club, fishers go to focused sites. By compositing from both sides of river, it is difficult to characterize risk from individual locations and the EPA is also interested in evaluating impacts of specific sources. It will also help to calibrate the FWM.

I. Taku asked if information from community groups could be obtained to help identify the places where people fish. Dana said that each fisher seems to have a spot, and she thought it would be useful to look at particular facilities and contaminants of concern. There may be certain side of the river where people are more likely to fish where we can focus, but we would need to look at the data from Eco as well to get a good idea of sites.

J. Jim McKenna expressed concern again that this was anecdotal evidence, which wouldn't be considered if, for example, LWG suggested that people claimed they no longer ate fish from the Willamette. Dana felt that if you have people eating the fish, you need to do more investigation, and felt that there was a need to look at a smaller area and focus on a source area rather than investigate the fishers. Eric suggested that the source specific information was needed so we're not underestimating risk and coming up with cleanup levels that are not protective.

K. It was noted that the drinking water issue may be more of a policy or legal issue and would be discussed at a later time.

L. Rick asked if the fish tissue sampling set forward in the memo was intended to make up for the previous compositing. Dana acknowledged that this was the primary concern.

VII. Wrap-up

A. Chip noted that EPA and LWG will be discussing the need for subgroups or collaborative discussion. We do have a short timeframe to consider. By mid-January we need a rough cut at the scope and scale of this data

collection effort. There should be a proposal to this group fairly shortly hereafter.

B. Eric suggested that there are several options on how to move forward with various details. There are lots of loose ends and deliverables that were left hanging, and we need to fit those in, as well as complete the Comprehensive Round 2 report.

C. Jim McKenna recalled that this meeting was intended to help clarify issues with the memo. There is a need to clearly identify the endpoint of the RI/FS process, and this is a first step to getting there. The Management's energy should go toward keeping things on an expedited path, but there are some big chunks of work that need to be completed – e.g., the LWG would like to do a thorough analysis of Round 2 data before we scope Round 3.

D. Rick felt that the meeting was very productive. He noted that everyone has always insisted that we want to move quickly to get site cleaned up. There is always some tension between the agencies and partners, but we have been reasonably effective thus far. There is a lot of work that needs to be done to try and keep this project on schedule, and over $30 million has been spent to date by LWG on the assessment. There will be a need to think creatively, and it will be important to avoid excessive dialogue and meetings. It would be a shame to miss key issues and concerns in the project and end up needing to go back and redo cleanups in the future.

Attachment: Catalogue of questions captured during the discussion by Mikell O'Mealy

CSM Overview

1. What amount of data exists to characterize upstream and downstream areas?
2. How to link hotspots above site and Willamette Falls to contaminant levels within the site?
3. If hotspots are found near Falls, what would next steps be to address them?
4. Do we know enough about upstream of the Falls to justify studies and inform a study design?
5. Are we more concerned about regular migration of contaminants down to RM 14 or movement of contaminants in big water events?
6. Regarding background, boundary, and recontamination issues, does EPA envision an upstream boundary with background levels defined upstream of boundary?
7. How do we design a study upstream of the Falls, and what does it tell us?
8. Is understanding background the only purpose for upstream fish tissue collection?
9. On Multnomah Channel, how far down the channel would the investigation extend? Is there value in a sediment trap at the channel mouth?
10. Are there any critical timing issues for FSPs related to this sampling work?
11. How do we distinguish between different sources in Multnomah Channel area, where we may have 2-directional sediment movement?
12. Is there desire to get another transect above RM 11? How much of that data is needed, and is it seasonal?

Fate and Transport, Food Web Modeling Needs

1. How does the mass-balance model proposed by the agency team get to concentrations in sediment and surface water?
2. Mass-balance models often don't balance; how are placeholders used when the model doesn't balance the way it needs to?
3. Does uncertainty in the model lead to a more detailed study effort, or to a management decision?
4. Does the code linking Fate and Transport to FWM exist?
5. What will we be collecting in R3 for Fate and Transport and FWM, and how should the data be collected?
6. Can we run the model with the data we have now?
7. If we break the river into segments, will we need to rethink the use of one average concentration for the whole river? What are the data needs for this?
8. Will EPA tell us what parameters need additional data collection, and which can be estimated from existing information?
9. What are advantages and disadvantages of predicting tissue recovery times, given the model uncertainties?

10. How much additional confidence and rigor will the modeling approach proposed by the agencies bring to the recontamination, MNR, and FW evaluations?
11. What are the schedule implications of embarking on the modeling approach proposed by the agencies?

Schedule implications are a broader consideration for all aspects of the Round 3 Data Gaps memo*

Areas of Potential Concern

1. The table provides surface and subsurface data needs, but the memo text says that there is a need to know the level of certainty and cleanup goals to design sampling plans. Is there contradiction here?
2. Where does riparian soil and plant tissue fit into Nature and Extent and Risk Assessment?
3. The identified upland source area information to be collected by DEQ; will that fit into the Fate and Transport evaluations in river? Is that information developed under DEQ's source control program? (yes)
4. Would we measure loading over various flow regimes? (Need to make sure upland and inwater data needs and scheduling match up.)
5. How does EPA want COI data gaps to be filled, especially new COIs?
6. Has EPA mapped the OHWM-MHWM zone? Do you have a clear definition of these two lines? How are they defined?

Ecorisk Assessment

1. Does "deleterious effects" equal growth, reproduction, survival, or is it more than that?
2. Reducing potential for "exposure" seems different than reducing "risk". Can we change the language to make it less broad?
3. Is the goal purely for CERCLA, or does it go beyond it to NRDA?
4. Terrestrial plants – will be assessed by upland RPs (to add footnote to the CSM).
5. Is riparian area a data gap? Yes, but/and need to assess what data we have at uplands.
6. How will the various additional lines of evidence in risk approach be used in decision-making?
7. Is there a shift in thinking toward assessing risks to individuals (including non-listed species), rather than to populations?
8. Why is EPA now not comfortable with estimating population risk through compositing (after approving the Round 1 compositing scheme and entire fish risk approach)?
9. What level of uncertainty is acceptable in the ERA? How is EPA relying on multiple lines of evidence to address the uncertainty?
10. One of the difficulties that may arise by sampling individual fish is the need to reduce the COPC list (sculpin may be only problematic species).

11. Integration of RI/FS and NRDA – there needs to be a clear identification of NRDA data needs distinct from CERCLA needs in the future. (Response: Everything in this memo is CERCLA related.)
12. For elements identified as “may be needed” in the data needs table, will we work through this later?
13. What weights will the different proposed LOEs have for assessing risk to fish from PAHs? Will empirical data take precedence over theoretical?
14. Would species sensitivity distributions rely on literature search? (yes)
15. If we collected sturgeon data, how would we get the sturgeon tissue, (which age classes would be used to resolve risk issue)? EPA partners and tribes can provide recommendations on what is needed for RI.
16. How strong is the link is between olfactory effects in laboratory studies and growth, survival, and reproduction for adult Chinook in the field?
17. Do we have criteria for determining how robust the BSAF relationship needs to be for use in the RI?
18. We saw poor sediment/sculpin relationship for some chemicals; we are hoping for a better relationship in fall 2005 invertebrate data; for the AVS+SEM use, under what circumstances would one consider doing this type of detailed assessment?
19. Would we consider other options for getting at bioavailability for benthic community? (yes)
20. Can we talk more about methods for filling benthic tissue gaps?
21. Can you clarify the use of data in FWM vs. calibration of model?
22. What would the proposed collection of fish eggs entail?
23. How would we compare egg TRVs to surface water concentrations?

Human Health Risk Assessment

1. The proposed addition of bivalve ingestion as an exposure pathway – is the justification for doing this based on anecdotal information?
2. Is the EPA requesting that the bivalve and crayfish data be combined for or should bivalve and crayfish ingestion be evaluated separately?
3. Do we need to incorporate all unique eating habits in the HHRA?
4. Would the proposed inclusion of a residential drinking water scenario change our risk conclusions significantly?
5. Adding analytes (PBDEs) – will collecting additional data cause us to call existing data into question or lead to further tissue collection efforts?
6. For upstream biota sampling – how do we sample these without knowing what upstream boundary is? Is the purpose to understand background or ambient levels or some other purpose?
7. For additional smallmouth bass samples near specific sources, is the objective to evaluate specific sources or something else?
8. How important is it to pin down uncertainty in areas where risk to Human Health from eating fish is known? How does it affect fish tissue data needs?

Next Steps

Timeframe – would like to have a rough cut of scope and scale of data collection by mid-January.

Process options – EPA partners develop workplan or scope of work; OR, LWG develops proposal; OR, combined efforts to do it collaboratively in smaller groups? A small group approach may be helpful to flesh out individual issues, to bring back for the bigger group.

Need to focus on finding a path forward to get to an endpoint.
A thorough analysis of R2 data could lead to full scoping of R3. But, we need to change our approach now and be very efficient without shortchanging issues.

Need to tease out key early items that need action and look at what's needed or not needed on deliverables list.

Try to separate schedule, budget, policy, legal, and technical issues to address them all effectively.

Need to provide LWG with direction on the comprehensive R2 site summary.